

# CLAIMS

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is as follows:

- 5 1. A diode array end pumped slab laser comprising:  
a laser diode having at least one diode bar for providing laser pump light in a vertical and horizontal direction to the optical axis;  
a first cylindrical lens for collimating said laser pump light in said vertical direction on said optical axis after said laser diode bar;  
10 a second cylindrical lens on said optical axis perpendicular to and after said first cylindrical lens for collecting laser pump light output from said first cylindrical lens and focusing onto a laser slab as focused laser pump light;  
a laser cavity on said optical axis after said second cylindrical lens comprising a laser slab of solid state crystal with a length and polished input and  
15 output sides, the slab accepting as input said focused laser pump light at said polished input side with unabsorbed pump light reflected within the laser slab and outputting from said polished output side absorbed laser energy, whereby laser pump light remains collimated perpendicular throughout said laser slab and  
20 said pump light further includes laser mode overlap for all of said laser slab length.
2. The diode array end pumped slab laser of claim 1 wherein said laser cavity further includes a Q-switch having input and output ends on the optical axis, with dichroic coatings at said input and out ends, said Q-switch for  
25 producing peak power pulses.

3. The diode array end pumped slab laser of claim 1 wherein said laser cavity further includes a non-linear crystal to produce additional wavelengths.

5 4. The diode array end pumped slab laser of claim 1 wherein there is further included a non-linear crystal after said laser cavity on the optical axis for produce additional wavelengths.

5. A diode array end pumped slab laser technique comprising the steps of:  
generating laser pump light in a vertical and horizontal direction to the optical axis;

collimating said laser pump light in said vertical direction;  
collecting laser pump light output from said first cylindrical lens and focusing onto a laser slab as focused laser pump light;

15 accepting as input said focused laser pump light into a laser cavity including at least a laser crystal having an input and output side, where unabsorbed pump light is reflected within the laser crystal and outputting from said output side absorbed laser energy, whereby laser pump light remains collimated perpendicular throughout said laser crystal and said pump light further  
20 includes laser mode overlap for all of said laser crystal length.